The High Altitude MMIC Sounding Radiometer (HAMSR)

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HAMSR is a millimeter wave temperature and humidity sounder that utilizes state of the art technology to enable substantially reduced size and mass. HAMSR is capable of measuring combinations of tropospheric, stratospheric and mesospheric temperature, water vapor and liquid water profiles (as well as precipitable water and column liquid water). In addition it has the potential to measure upper-atmosphere water vapor and ozone profiles (from high altitude aircraft), cloud ice content, rain rate, surface temperature, surface spectral emissivity, and related parameters which can be derived from those measurements. The near term applications focus on tropospheric temperature and water vapor profiles. HAMSR has been under development for the past two years and the first flight demonstrations are planned for the summer of 2001 aboard a NASA ER-2 aircraft. The instrument operates in three frequency bands centered around 53, 118 and 183 GHz. The receivers for the two lower frequency bands are based on state of the art Microwave Monolithic Integrated Circuit technology and other solid state technology that enables the small instrument size and mass. HAMSR has a flexible, modular system design so the instrument can be easily reconfigured to meet mission-specific measurement objectives. In addition to the ER-2 potential platforms for the instrument are unmanned aerial vehicles.